

EPA PDF Creation and Accessibility Guidelines for the Web

A Compilation of Best Practices Found Throughout EPA

I. Introduction - “To PDF or Not, That is the Question”

PDFs can be a valuable formatting tool for presenting information in some circumstances, but the PDF format also has drawbacks. A reader must have a certain level of computer literacy to download the Adobe Acrobat Reader, to navigate through a PDF, or to find specific information within a document. Visually impaired readers who use assistive technology like JAWs may find it hard to read a PDF, even if its author was careful to design it to be as accessible as possible. Even after being processed through Adobe's Accessibility Checker, some PDFs may still generate errors when accessed using assistive technology.

For these reasons, among others, we recommend using the PDF format only if:

- the document is longer than 5 pages
- you need to preserve the formatting or layout of the original document
- you need to publish a paper document for which no electronic version exists
- you want to prevent people from modifying the document

II. Preparations

- **Starting with a “clean” document**
You can improve the conversion of a source document into PDF if you create the document with Section 508 accessibility in mind.
 - Keep the page format simple.
 - Avoid creating multiple columns of text.
 - Avoid placing text, graphics or tables side-by-side.
 - When creating tables, place the caption or description of the table right above and outside of the table.
 - Use the “**Table QuickCreate**” feature in WordPerfect for creating tables instead of using the tab and spacebar keys to create the “look and feel” of a table.
 - Include clear, descriptive captions for charts, tables, graphs, etc.
 - Use standard fonts - Arial, Courier, Helvetica, Times New Roman; font size should be 10 - 12 point depending on the font used. Font and font size should be consistent throughout the document.
 - Limit the use of special fonts and symbols.
 - Do not use letters for numbers. Use the number one “1” rather than the letter “l” and the number zero (0) rather than the letter “O.”
 - Do not use watermarks.
 - When creating a table of contents, do not use a series of periods to separate the information from the page number.

- **Tools required to convert document to PDF**
 - **Adobe Acrobat** - (complete software package, not just the Acrobat Reader). Included in Adobe Acrobat is Distiller which is an important component of the software for optimizing the PDF file, file management, and accessibility.
 - **NOTE:** If you are buying Adobe Acrobat 6.0, get Acrobat Professional if you can. It has several important accessibility features not available in Acrobat Standard. Be sure to review Acrobat Professional's system requirements first, however, to make sure that it's compatible with your operating system.
 - **Make Accessible Plug-in** - Works in conjunction with Adobe Acrobat software. This plug-in generates the internal PDF document structure, so that the PDF file can be made Section 508 accessible. It is free and is available directly from Adobe's Website. <http://access.adobe.com>
 - You can make a PDF from any file you can print. The most common software applications you are likely to use might be **WordPerfect 9, Word, or Adobe Pagemaker**.
 - WordPerfect **source document** for conversion to an accessible PDF document.
- **Best conversion tool**
 - **Distiller Method - (Preferred)**. Distiller produces the best results with fewest errors.
 - **Print to PDF Writer Method**
 - Image and text quality comparable to Distiller Method
 - Generates more accessibility errors than the Distiller Method
 - PDF file size is comparable (264 kb) to Distiller Method (275 kb)
 - **Publish to PDF Method** (a utility in **WordPerfect**)
 - Poor image and text quality
 - Generates the greatest number of accessibility errors
 - PDF file size is very large (4165 kb)

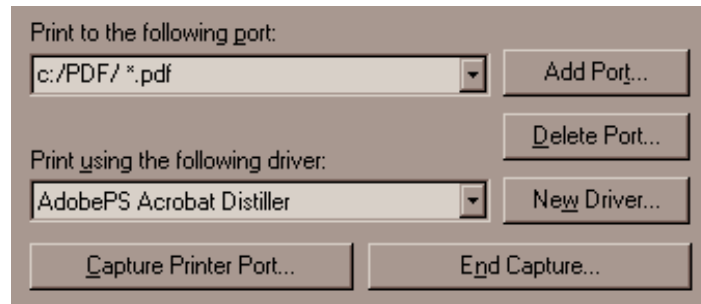
III. Converting a document to PDF

A. Setting Acrobat Distiller Properties

First of all – where do you want Acrobat to save the PDFs it creates?

1. Go to the Printers folder: select **Start > Settings > Printers**.
2. Click the **Acrobat Distiller** icon. The Acrobat Distiller dialog box appears.
3. Select the **Printer** menu option.
4. Click on the **Details** tab.

5. In the block below where it says “Print to the following port”, change the location to reflect where you want the PDF file to be saved.



Print to the following port:

c:/PDF/ *.pdf

Add Port...

Delete Port...

Print using the following driver:

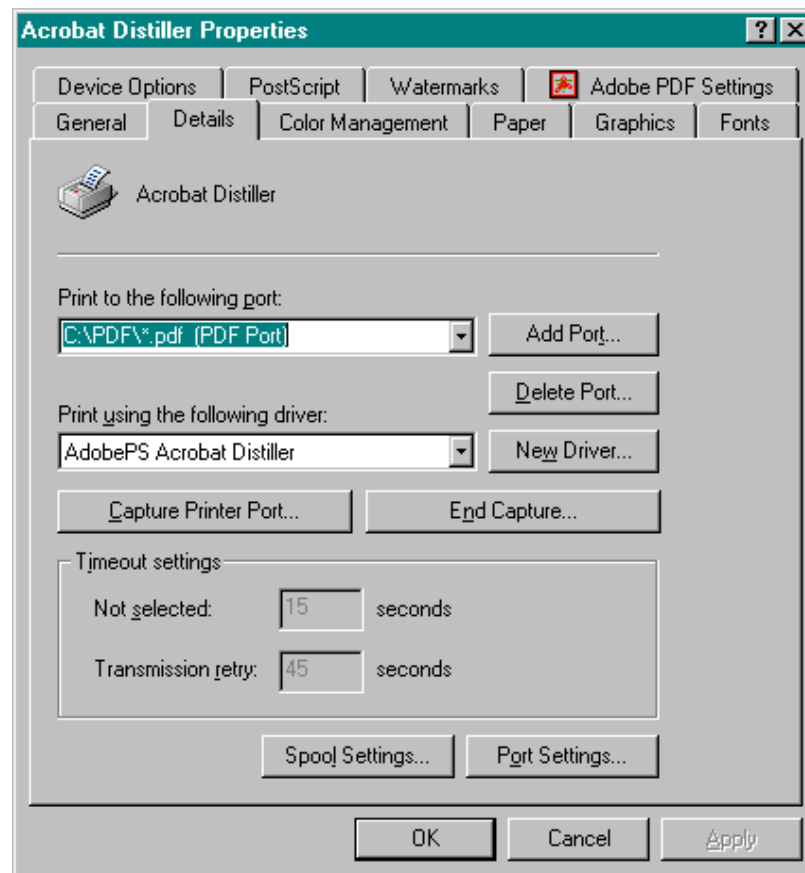
AdobePS Acrobat Distiller

New Driver...

Capture Printer Port...

End Capture...

6. In the block below where it says “Print using the following driver”, it should display AdobePS Acrobat Distiller. If it does not, click the down arrow to the right of the block and select it.



Acrobat Distiller Properties

Device Options | PostScript | Watermarks | Adobe PDF Settings

General | Details | Color Management | Paper | Graphics | Fonts

Acrobat Distiller

Print to the following port:

C:\PDF*.pdf (PDF Port)

Add Port...

Delete Port...

Print using the following driver:

AdobePS Acrobat Distiller

New Driver...

Capture Printer Port...

End Capture...

Timeout settings

Not selected: 15 seconds

Transmission retry: 45 seconds

Spool Settings...

Port Settings...

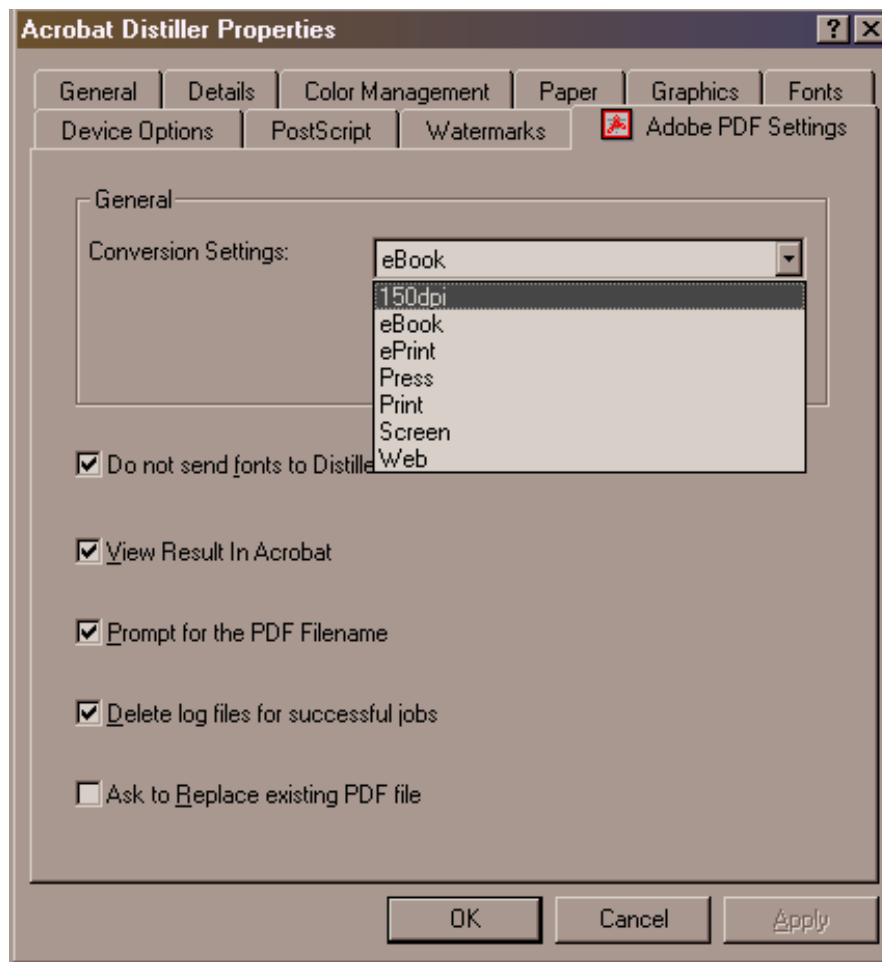
OK Cancel Apply

B. Setting Distiller Job Options Settings

Whenever you print to Acrobat Distiller, it uses a pre-saved set of conversion settings called “Job Options”. Acrobat comes with several conversion settings already. **You may find that the one called “Screen” is just what you need for making documents to view on the Web.**

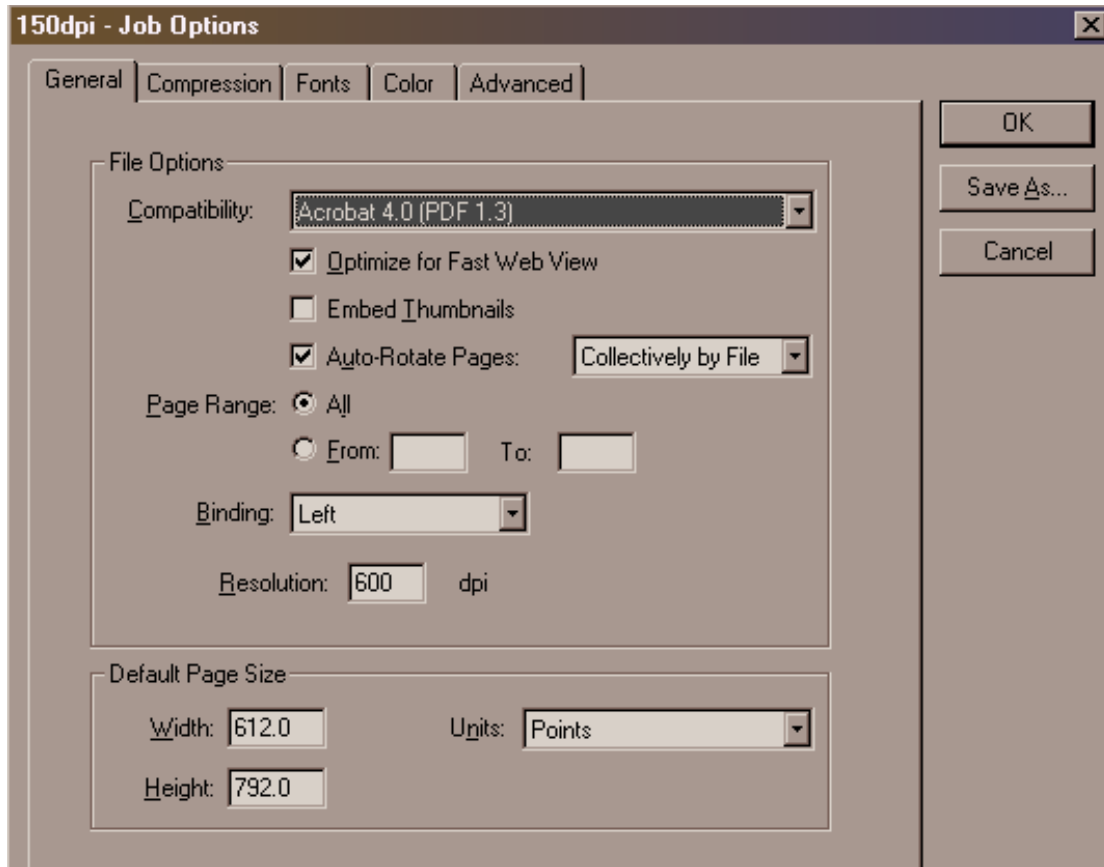
If not, and you wish to create a customized job option, use the settings described below and save them as a Job Options called “Web” (or whatever name you prefer). **You will only have to complete this step once. Distiller will save your newly created customized job option so that you can use it in the future.**

1. Select **Start > Settings > Printers**, right-click on **Acrobat Distiller** icon, choose **Properties**.
2. Select the **Adobe PDF Settings** tab.
3. Click the **Edit Conversion Settings** button to get started.

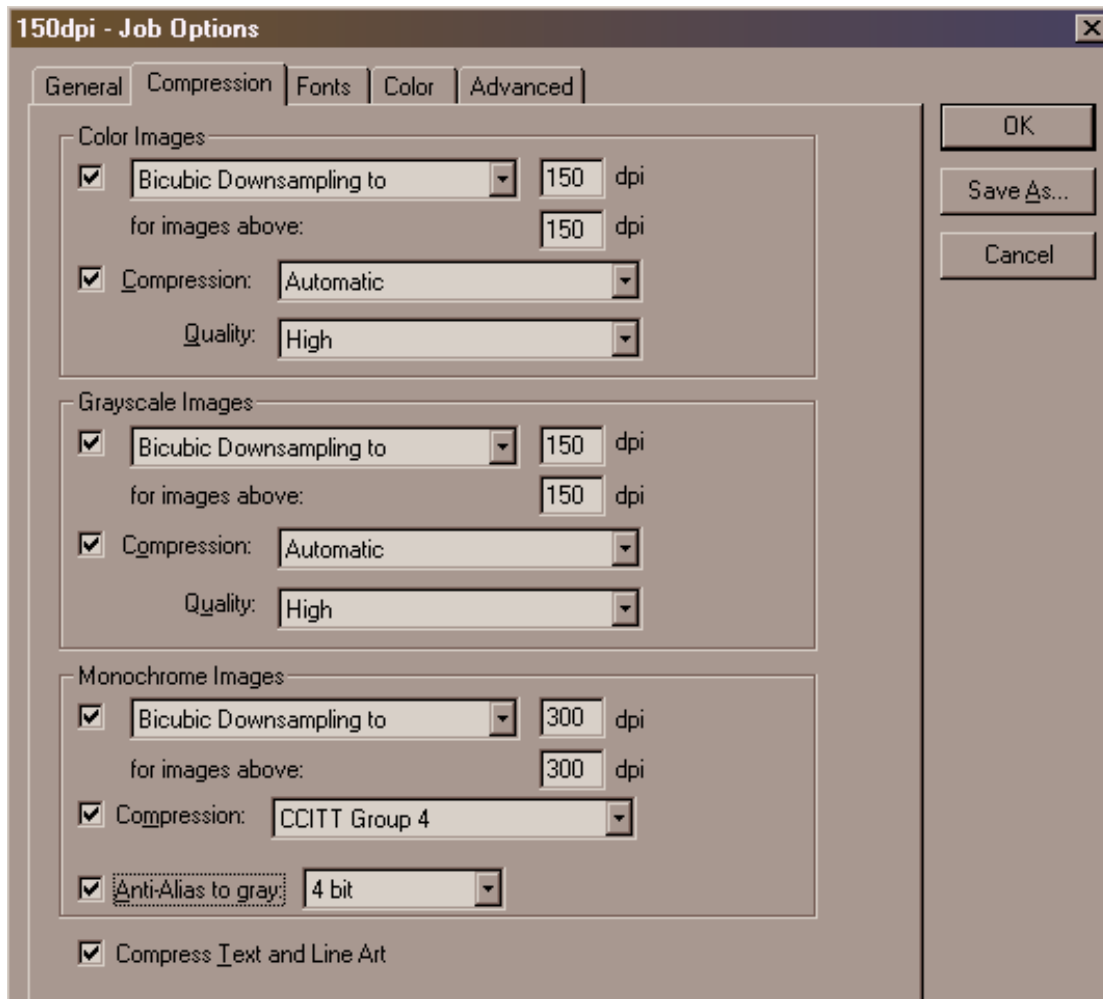


4. Select or deselect the checkboxes so that they look like the illustration above, then click OK.
5. Select **Settings → Job Options**.
6. There are five categories: **General, Compression, Fonts, Color and Advanced**. Each may be selected individually by clicking the appropriate “tab”.

7. Select the “General” tab

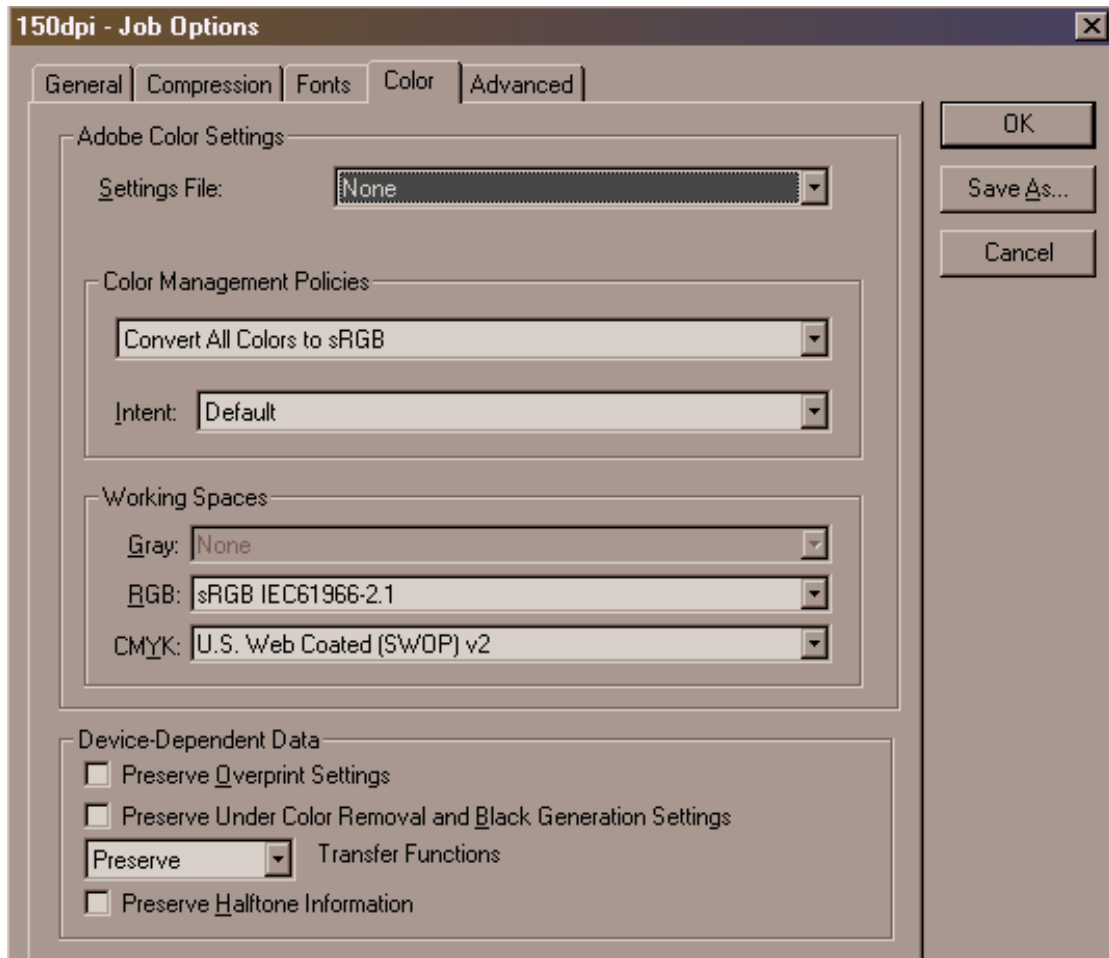


8. **File Options** section: **Compatibility** - Agency guidelines say to use the most current; however, currently the majority of our users are still using Acrobat 4.0. To change selection, click the down arrow to right of the box, and make your selection.
9. Make sure to select options to “**Optimize for Fast Web View**” and “**Auto-Rotate Pages**”. Pages should be rotated **individually**; click the down arrow to right of the box to change selection
10. Resolution considerations. The lower the setting, the more pixelated (grainy) the graphic will appear. **Higher settings will dramatically increase the PDF file size.** A setting of 300-600 dpi should be sufficient for most situations.
11. **Default Page Size** is set to 8 ½ inches by 11 inches - represented here in Points.
12. Select the “**Compression**” tab - the compression settings deal with monitor resolution quality of the PDF. The settings shown here will provide more than sufficient results for average to above average PDF documents. Adjustments may be required where high color photographic images have been used.

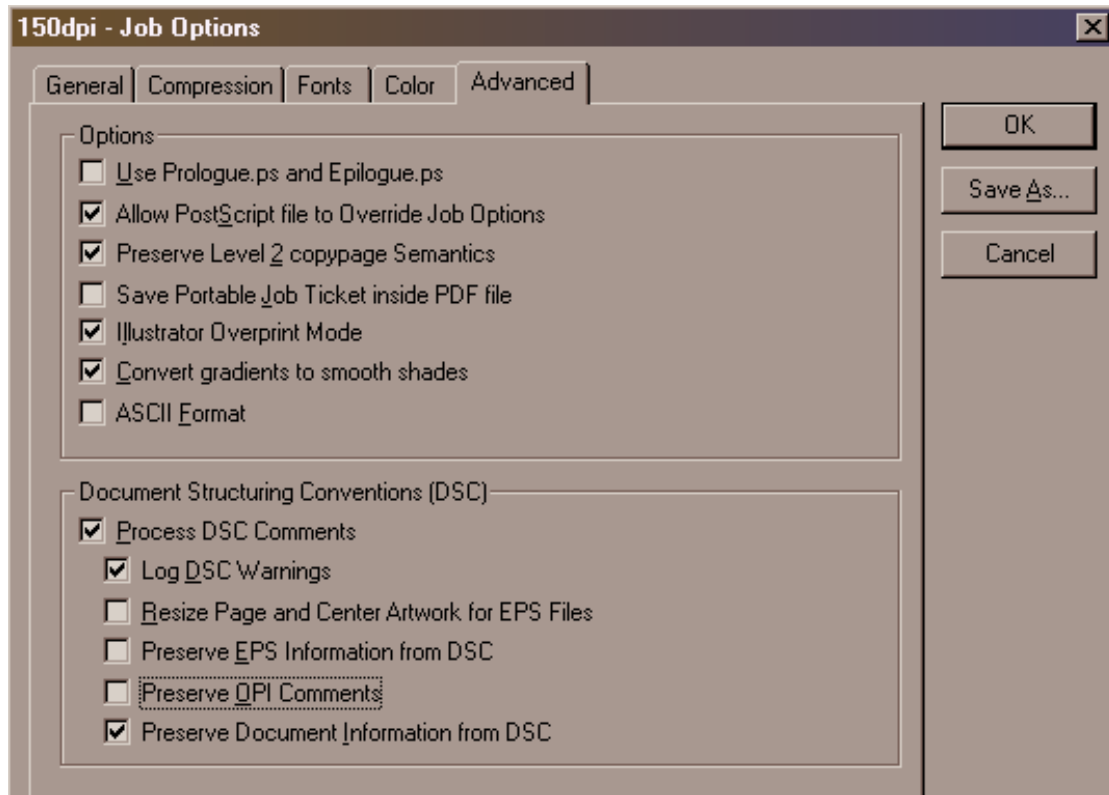


13. Select the **"Fonts"** tab
14. **Do not** check the option to **Embed All Fonts**. Embed fonts only when it is required, as embedding fonts increase the PDF file size.
15. In the past dealing with some fonts has been problematic. For example, a small box would be substituted in a PDF document where math symbols, Greek characters or other special characters had been used in the WordPerfect source document. Specific WP fonts were restricted from being embedded in the PDF since they were proprietary. Corel has released a new WP font upgrade pertaining to these proprietary fonts which permits them to be embedded.
16. Before a font can be embedded into a PDF document, the location of the font set has to be determined.
17. Select the font location by selecting an option from the drop down list. Click the down arrow from the box just below the word **Embedding**, then make a selection.
18. After a selection has been made, a list of font sets will be displayed in the **Embedding** panel. Select the font or fonts to be embedded from the listing by pressing down the **"Ctrl"** key and selecting a font.

19. When finished with the selection(s), click the [**>>**] double right arrows to transfer them into the **Always Embed** panel.
20. Select the **"Color"** tab. The color section pertains to settings for controlling the printing of the PDF document. Use the settings shown here.



21. Select the **“Advanced”** tab.



22. Use the settings shown here.
23. Click the **“Save As”** button to save the new Job Options settings. The **“Save Job Options As”** window is displayed.
24. In the block to the right of the **File Name**, enter a **new file name** for the new Job Option, then click the **“Save”** button.
25. The screen display will return back to the Job Option’s category window where the “Save As” button had been selected.
26. Click the **“Ok”** button. The **“Acrobat Distiller”** window is displayed. The new Job Option should be displayed in the block to the right of the Job Options.
27. You are finished. You need only complete this step once. When creating PDFs in the future, you may use any of the Job Options you have created, or any of the pre-selected Job Option settings.

C. Converting the source document to PDF

NOTE: Adobe Acrobat Distiller must be operating continually during the file conversion to PDF, and during the Section 508 accessibility process

1. Click on the “**Acrobat Distiller 5.0**” icon, or select **Start → Programs → Acrobat Distiller 5.0**
2. The “**Acrobat Distiller**” window is displayed. Select the appropriate Distiller Job Options setting by selecting a **Job Options** from the drop down list.
3. Once a Job Option has been selected, **minimize the Adobe Distiller** window so that it continues to run in background on the PC.
4. Open the document (Wordperfect, Word, or other source file) to be converted to PDF.
5. Select **File → Print**. The “**Print to... (LPT1)**.” window is displayed.
6. Select “**Acrobat Distiller**” from the current printer listing, then click the “**Print**” button.
7. Use “**File/Save As**” to save your document. Be sure to use “**Save As**” instead of “**Save**”, even if you are not renaming or moving the file. “**Save As**” optimizes the file for web use, among other things.
8. Make sure the name of the file is understandable. Remember, users may see this file in a search result list – it has to make some sense.
9. Remember that the PDF file is saved to the directory location specified in the Distiller Properties.
10. Now that the document has been converted to PDF, close the source (WordPerfect or other) document and exit from the source application.

IV. Preparing the PDF for the Accessibility Process - **Adobe Distiller 5.0 must continue to run in background on the PC during the Section 508 accessibility process.**

- Click on the “**Adobe Acrobat**” icon, or select **Start> Programs> Adobe Acrobat**
- Select **File> Open**, select the newly converted PDF file, then click the “Open” button.

A. Create a Document Summary.

1. Select **File> Document Properties> Summary**, or click on the down arrow in the upper right margin of the PDF document to display the document summary information window.

Document Summary [X]

File: D:\Bead Docs\bead_disbenes1.pdf

Title: US EPA - Benefits of Disulfoton on Selected Vegetable Crops and C

Subject: Benefits of Disulfoton on Selected Vegetable Crops and Cotton

Author: US EPA, Office of Pesticide Programs, BEAD

Keywords: pesticides,disulfoton,vegetable crops,cotton,benefits

Binding: Left Edge [v]

Creator: WordPerfect 9 - [F:\DisBenes.9.27.01.wpd]

Producer: Acrobat PDFWriter 4.05 for Windows

Created: 9/27/01 9:45:58 PM

Modified: 9/27/01 9:51:30 PM

File Size: 39.9 KB (40,821 Bytes)

Security: None

PDF Version: 1.4 (Acrobat 5.x) Fast Web View: Yes

Page Size: 8.5 in x 11 in Tagged PDF: Yes

Number of Pages: 5

OK Cancel

PDF Document Summary Information – It is very important to complete the PDF document summary information. It is used by the search engine to find documents and it is used by the search engine to create the information on the results page. When there's a search result that reads <c:\MyDocuments\water\wetlands\pc0983723.pdf> that means the PDF document summary information was not completed.

2. **File → Document Properties → Summary.** This menu requests **Title, Subject, Author, and Keywords.**
3. **Title** is important and should be understandable.
4. **Subject** should be a short descriptive summary of the document.
5. **Author Information** should use the following format: USEPA, Office Name, Division Acronym, and where appropriate, author name.
6. **Keywords** should be specific and descriptive. They should be entered as lower case; separate words with commas but no spaces (e.g: pesticides,chemicals,methods,study). Use at least two keywords and no more than ten.

B. Create Web Links

1. To activate URLs in the PD, select **Tools → Locate Web Addresses → Create Web Links from URLs in Text...**
2. The “**Create Web Links**” window is displayed. Keep the default to Automatically generate Web Links on which pages?.. (All - for all of them). Click the “**OK**” button to continue.
3. Caution: if the link in the source document does not contain the full URL, including the **http://**, the link will not be created. You can manually create links by using the link tool.



C. Create

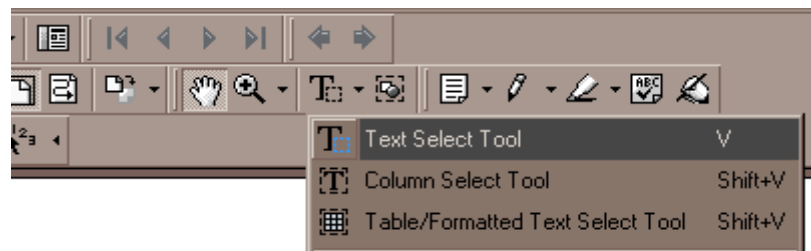
Bookmarks

Bookmarks are an important feature because they provide easy navigation through the PDF document, and provide a usability function for both sighted and non-sighted users.

- Include bookmarks when the PDF document is **five (5) pages or longer**.
- Follow the document's **Table of Contents**, if one exists, otherwise according to the **major headings** of the PDF document.

1. Creating Bookmarks

- Open or expand the **Bookmark** tab
- Use the **Text Select Tool** to select the text in the document to serve as the bookmark.



Right-click on highlighted text

and select **New Bookmark** from the menu options.

- Notice the **New Bookmark icon** (icon next to the word Bookmark)

2. Moving Bookmarks

- New bookmarks you create will be added to the end of your bookmark list.
- If you missed one on the first go-around and you add it later, it will be created at the bottom of your bookmark list.
- Highlight the one you want to move and drag it to the place it should be on the bookmark list.
- Acrobat will ask you to confirm the change.

3. Changing Bookmarks

- **You can indent bookmarks** - make your bookmarks as normal. The list will start out all lined up together. Highlight the one(s) you want to indent. Drag your selection a little to the right and up. Acrobat will show a circle with a line through it when you can't drop it. Acrobat will show a small horizontal line (an "indent mark") when you can drop it. One of those lines will be indented under the bookmark above. When you have your bookmark at the indent mark you want, drop it there. Acrobat will ask you to confirm the change.
- **You can change the text of a bookmark.** Right-click on the bookmark you want to change. Choose Rename to change the text of the bookmark.
- **You can change the destination of a bookmark.** Move in your document to the page you want the bookmark to point to. Remember to keep the view magnification the same as the other pages (Fit Width is recommended). Right-click on the bookmark you want to change. Choose Set Destination. Acrobat will ask you to confirm your change.
- **You can bold or italicize the text of a bookmark.** Right-click on the bookmark you want to change. Choose Properties. Under the Appearance section of the window, choose the attribute you want for your bookmark text.

4. Tips about Bookmarks

- DO NOT change the View of a page from Bookmark to Bookmark. Use the **Fit Width** view for PDF documents with bookmarks.

5. Bookmarking to another PDF file

- If you have a pressing need to create a bookmark that links to another PDF file, you can. It takes more maintenance and can be quite tricky.
- Be sure both the target and originating PDF files have good names and are in the same directory. **If you change the file names after making these bookmarks, or move the files into separate directories, the bookmarks will not work.**
- In Acrobat, open both files – the originating file (the one the bookmark will be in) and the target file (the one the bookmark will point to). In the originating file, create a new bookmark.
- Right-click on the bookmark and select **Properties**. Choose **Go To View** for the action.

- While the **Bookmark Properties** window is still open, select **Window** in your menu bar, and go to the bottom of the menu where it shows the files you have open. Select the target file. (Or use Control-F6 to switch among your open files.)
- The target file will show up in Acrobat, but the **Bookmark Properties** window also will remain open.
- Select **Edit Destination** in the **Bookmark Properties** window. This tells Acrobat that this view (the first page of the target file) is the one you want to set for the bookmark in the originating file.
- Select **Set Action** in the **Bookmark Properties** window. This tells Acrobat that you are done setting this bookmark.
- The **Bookmark Properties** window will disappear, and you will be taken back to the originating file. Your bookmark now is set. When you click it, it will take you to the target file.

6. Deleting Bookmarks

- Select the bookmark(s) to be deleted from the Bookmark area.
- Use one of these methods to delete the bookmark (1) Click on the “**trash can**” icon, or (2) Select **Bookmark -> Delete Bookmark(s)**, or (3) Right-click on the bookmark to be deleted and select Delete from the menu options.

D. Set the Opening View

If you have bookmarks, set the Opening View to Page and Bookmarks

- **File>Document Properties>Open Options**
- Select Bookmarks and Page

F. Save Your File

- **Use File/Save As** - be SURE to use **Save As**, not Save – it consolidates the file and makes it faster for downloading or online reading.
- Double-check that you have a good name for the file, and that it's in the correct folder in your working web directory.

G. Test Your File

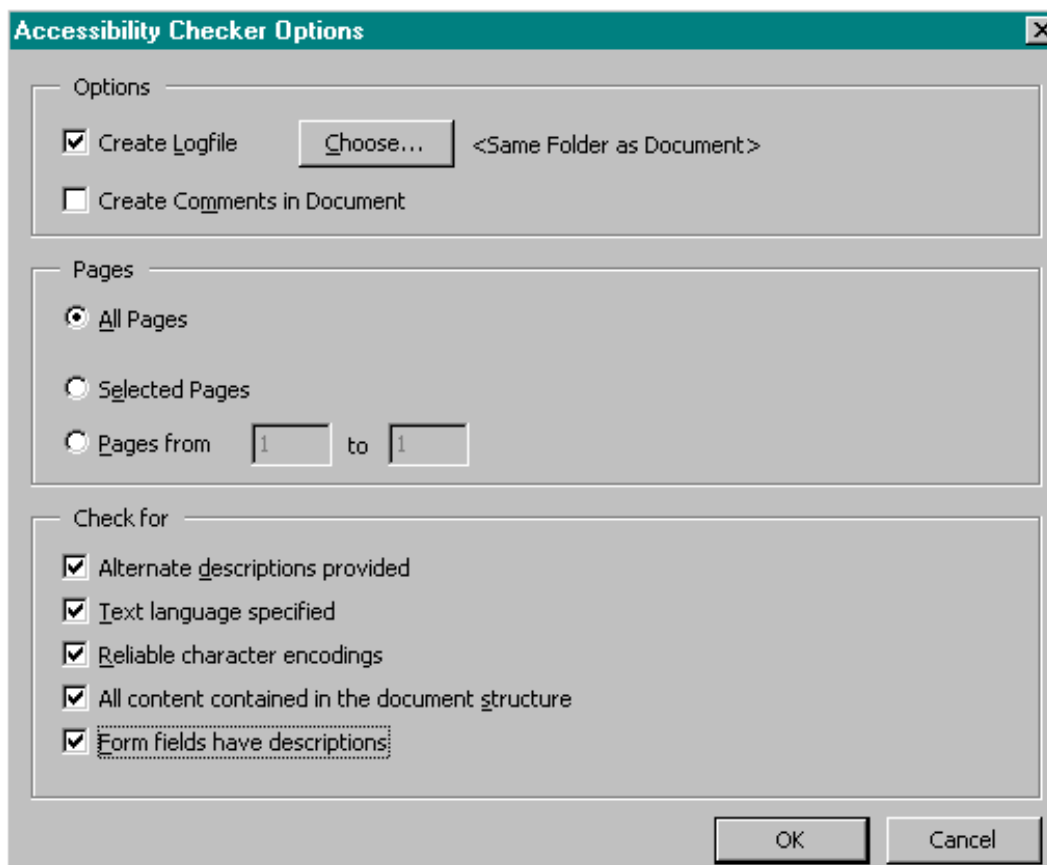
- **Close the File, then Open it again.**
- **When the file opens, either Bookmarks or Thumbnails must open, too.**
- **Click on a couple of Bookmarks.** Do they go where you want them to go?
- **Review the Document Summary**
Is all the Document Summary information filled out?

In the lower right hand of the window, does Fast Web View say “Yes?” This means the file has been optimized. If the Fast Web View says “No,” your file will not pass technical review.

v. Using the Adobe Make Accessible routine

A. Adobe’s Make Accessible plug-in Running the Make Accessible routine only creates the tagged document elements, and does not mean that the PDF will be Section 508 compliant, or accessible. Additional work will be required to update information within certain “tagged” elements to make them Section 508 accessible, so that assistive technology devices (screen readers) are able to access and present that information to the disable individual.

- Download the most recent plug-ins and patches from Adobe prior to making any files 508-compliant. The web site to check for the most recent plug-ins is:
<http://www.adobe.com/products/acrobat/>
- Download and install the “MakeAccessiblePlugIn.exe” file from Adobe’s web site at
<http://www.adobe.com/support/downloads/detail.jsp?ftpID=1161>.
- With the PDF file open in Adobe Acrobat, select **Document > Make Accessible**.
- Next, go to **Tools > Accessibility Checker**. This plug-in from Adobe checks the document and tells the user where errors in reading the document occur.



- The “**Accessibility Checker Options**” window is displayed. Use the default selections shown above. Note: If your WordPerfect document contains links, use Acrobat’s **Link Utility** to make the links before making the document accessible. PDFs made from Word bring the links over automatically.
- The log file generated by the Accessibility Checker is very helpful when attempting to find nested tagged document elements for Section 508 enhancement updating. The Logfile generated by the Accessibility Checker is an excellent resource for indicating the types of accessibility errors in the PDF document and where those errors are located.
- If errors were found when using the Accessibility Checker, they will need to be corrected.

B. Fixing accessibility errors in a PDF file

- If Adobe’s Accessibility Checker finds errors in a PDF file, it will return the message, “the checker found problems which may prevent the document from being fully accessible.” This message will be followed by information on the type(s) of error(s) found in the document.
- Locate and fix the problem areas identified by the Accessibility Checker program. This can be very tedious, frustrating and time consuming.
- Most PDF document accessibility concerns identified by the Accessibility Checker are a result of graphical information (figure tags) requiring the addition of alternate text descriptions to make them accessible.

C. Tags and the tag structure tree

- Assistive technology, such as screen reader software, uses the **tag structure tree** of an accessible PDF to make the content of the document available to people with disabilities. The information is written into a PDF file by Acrobat in the form of tags. Tags contain, identify, mark, and order elements in a PDF document. These elements include items such as a block of text, a figure, image, or table.
- In addition to identifying the content of elements on a page, tags identify for screen readers the order in which those elements should be read and provide a means to give descriptive text (called **alternate text**) for visual elements (charts, tables, photos, graphics). Tags are organized by Acrobat 5.0 into a tag structure tree—a diagram that shows the hierarchy of elements in a document.
- To view the tag structure tree in Acrobat 5.0, open the Tags palette by selecting **Window > Tags**.
- In the tag structure tree, a plus sign next to an element indicates that it has at least one child tag associated with it. Clicking on the plus sign will show the nested tags.
- Higher level tags in the hierarchy are known as **parent tags**. Tags nested under parent tags are known as **child elements**. Some attributes of the parent tag, such as document language, are inherited by the child elements, and edits made to a parent tag will affect the child elements. Moving or deleting a parent tag will also move or delete the child elements.

D. Adding alternate text

- The Accessibility Checker may find some elements with no alternate text. This is a common accessibility problem for graphic elements in PDF files. Follow these steps to add alternative text to elements in a PDF:

1. In Acrobat, use the **TouchUp Object** tool and click on a graphic that needs alternate text. These will be marked with a red box if the “Create Comments in the Document” option was selected in the Accessibility Checker.
2. In the Tags palette, click on the Tags drop-down arrow, and choose **Find Element From Selection**. This will highlight the tag in the structure tree that corresponds to the graphic you clicked on. Right click on **<Figure>** and go to Element Properties. . .
3. The **Element Properties** box appears. Type in a title for the image.
4. Select **EN-US** from the Language drop-down list. Select **OK**. Note: The “Actual Text” line is where content for the existing caption is located. A document that already contains captions may not need alternate text. This is why it is helpful to generate captions for each figure and image during the generation of a document.
5. Repeat Step 2 for any additional images without alternative text, as indicated by the red border around the image.
6. After corrections or proper entries have been made, delete the red border by selecting the **Hand Tool** or **Text Select Tool**. By selecting the image, the red border will become blue. Press the **delete** button to delete the blue border. If the red border is not deleted, the Accessibility Checker will read the image or figure as a problem and not recognize that the necessary corrections or additions have been made.

E. Adding tags to the tag structure tree

- Occasionally a block of text or other element will not have an associated tag on the tag structure tree. The Accessibility Checker will return a message that says, “element(s) inaccessible because they are not contained within the structure tree.” Tags for these elements can be added to the tag structure tree manually.
- There are several different ways to find missing tags and add them to the tag structure tree.
 1. Use the “Find Unmarked Content” tool.
 2. From the Tags drop-down menu in the Tags palette, select **Find Unmarked Content**. . .
 3. The Unmarked Content pop-up window provides an option to search the current page or the entire document. When an element without a tag in the tag structure tree is found, the element is highlighted in the document. The Unmarked Content pop-up window can then be used to assign a title and any type of tag to that element. The new tag will be placed at the end of the tag structure tree, and can then can be repositioned to the desired location in the tag structure tree (see Reordering Tags, below).
 4. Another way to find unmarked elements in an accessible PDF is to use the **TouchUp Order** tool.
 5. To view the TouchUp order, click on the “**T**” menu button and select **TouchUp Order Tool**.
 6. After the **TouchUp Order Tool** is enabled, a visual representation of the tags in the structure tree for the page is displayed with the text of the document. Any

element that does not appear inside a blue, numbered box is not contained within the tag structure tree and will not be recognized by accessibility software. The numbers show the order in which the tags will be read by the screen reader software. Note: Changing the order of the numbered boxes in the TouchUp Order view will not change the order in the tag structure tree.

7. To add a tag to the tag structure tree using text in the document, **select the text from the document that needs a tag**.
8. The tool used to select the element will depend on how tags are assigned to the elements in the tag structure tree. Use the **TouchUp Text Tool** to select lines of text; use the **TouchUp Object Tool** to select paragraphs, images, and other elements. The **Text Select** tool can be used to select portions of lines.
9. From the Tag drop-down menu, select **Create Child Element From Selection**. The newly created tag will be placed **at the end** of the entire tag structure tree. When the tag in the tag structure tree is selected, the text in the document will be highlighted. The new tag can be repositioned so that it will be read in the correct order by screen reader software.

F. Reordering tags

- It is sometimes necessary to reorder tags within the tag structure tree to make sure they are read in the correct order by screen reader software. To move a tag in the tag structure tree, select the tag with the mouse, drag it to the desired location, and release the left mouse button to drop the tag into place. Note: Use caution when adding or deleting tags from the structure tree. Always work on a copy of the original tagged PDF and check the modified PDF for errors.

G. Changing the type of element in the tag structure tree (so screen reader can't read)

1. The document author may elect to change the type of tag for a specific portion of the document so that the screen reader software reads the document a certain way. For example, changing the element to an **artifact** means that the element won't be read by screen reader software even though it remains visible on the page. If the document was originally written in WordPerfect, tags for the headers and footers of the document will be read on each page by the screen reader. These elements should be manually changed to an artifact so that they won't be read on every single page.
2. To change the type of element in the tag structure tree, open the tag structure tree in Adobe Acrobat by selecting **Window > Tags**.
3. Select the desired element in the document. In the **Tags** palette, click on the tags drop-down arrow and choose **Find Element from Selection**. This will highlight the tag in the structure tree that corresponds to the selected element. Right click on the contents of the tag, not the tag itself. From the drop-down menu, select **Change Element to Artifact** and click OK in the pop-up window.
4. The artifact remains visible on the page, but it won't be read by a screen reader. (Note: If the document is originally written in MS-Word, tags will not be created for headers and footers, so they will not have to be changed to artifacts.)

H. Tips For Creating a Tagged PDF Document

1. **Links** - Add the links to the PDF file before using the **Make Accessible** plug-in. Adding the links prior to making the PDF accessible will not generate errors. PDFs created directly from Word will already contain links.

2. **Inserting New pages** - Do not insert new pages into a tagged PDF document. Often, files will become corrupted during this process. It is better to add pages to the original source document, and then run the Make Accessible routine again.
3. **Simple layouts** - Text blocks broken by graphics and/or continuing on the next page, will not read correctly. The screen reader will read all contents on the first page before continuing to the next page. No amount of retagging or reordering of tags in the structure tree will fix this problem in a document with a complex layout. A document with a simple page layout will avoid the need for manually retagging the code in Acrobat 5.0.

I. More complicated Section 508 accessibility problems

- **An example where multiple “tags” were generated during the Make Accessible process.** There are a few problems or concerns when a single piece of graphical data is interpreted, and multiple tags are generated. First of all multiple tags clutter the PDF document structure with too many extraneous and unnecessary “figure” tags. Remember “tagged” information is not seen by the sighted user and is only used with assistive technology by the disabled. A disabled individual only needs to be told an accurate, concise and meaningful description of the graphical information. Therefore only one figure tag is all that is required for each graphical image.
- If the extraneous tags are not “cleaned up” and removed, assistive technology devices will attempt to read every tagged element represented in the PDF document. Image data is not necessarily sequentially tagged during the conversion process. If JAWS screen reader software were used to read this information, it would be read in random order and would be meaningless to the disabled user. More significantly, JAWS would get bogged down reading each and every fragmented bit of graphical data.
- The solution to the multiple tags situation is to delete all but one of the extraneous figure tags, then provide alternate text to the last remaining figure tag representing the graphical information.
- **An example where a small portion of a table has been tagged as a figure during the Make Accessible process.**
- When a table is converted to an accessible PDF, we have noticed with great frequency that the table or data cell in the far most upper right corner will be tagged as a “figure”. This is not a significant problem, but it does create a situation where the person correcting the “tags” for accessibility has the burden of locating them to determine their relevance.
- The solution to this situation is to delete the figure tag, but be careful not to delete the underlying cell content information.

VI. Making PDFs available to search engines

Two factors determine a user’s ability to find PDFs with a search: the search engine on the host server and the presence of a title and keywords in the PDF’s **document summary** fields. EPA’s search engine supports PDF searching, but the information fields in the document summary must be filled manually.

See Section IV, “**Create a Document Summary**”

VII. Testing your PDF using accessibility software (JAWS)

Even when the Adobe Accessibility Checker says that no errors were found in the document, errors may be found while listening to the document through screen reader software, such as JAWS. The following types of errors may occur:

- Content is read out of order
 - Some items are not contained within the tag structure tree
 - Tables and columns are not read correctly
 - Content is tagged with the incorrect type of element
- Note: Even though a process used to correct an error may work in one document, the same process may not work in another PDF document. This may depend on the type of software originally used to generate the document.

A. Assistive Technologies This section gives an example of screen reading software that can be used by the visually impaired to search and read information on the Internet. However, this is only one example of the many types of assistive technologies available to people with disabilities. More information on assistive technologies is available from the U.S. Department of Education's National Institute on Disability and Rehabilitation Research at http://www.abledata.com/Site_2/default.htm

B. Using JAWS software to listen to 508-compliant PDF files (Note: JAWS is not freeware. For product listing and pricing information go to: http://www.freedomscientific.com/fs_products/software_jawspricing.asp.)

- JAWS is a screen reading application that enables visually impaired computer users to listen to document content.
- JAWS and other screen readers interpret the information contained in the tags of an accessible PDF to make the content audible.
- JAWS can read a correctly tagged document page from top-to-bottom and from left-to-right.
- There are no special installation or setup requirements to run Adobe Acrobat with JAWS. Simply start the program using normal procedures. When the PDF document loads, a user will hear "loading document, please wait." After the document loads, JAWS will begin reading.
- If the document is not accessible, JAWS will say something like "the document appears to be empty."
- JAWS uses keystrokes extensively for navigation. The keystrokes vary depending on your system (laptop versus desktop) and the software you are running.
- JAWS has several utilities that allow the user to customize the software. For use as an accessibility checker for PDF files, the following are useful modifications:

1. Dictionary Manager can be used to ensure correct pronunciations

- The Dictionary Manager allows users to change the way words, phrases, abbreviations, or ANSI symbols are pronounced.
- To add words to the Dictionary Manager in JAWS, choose **Utilities > Dictionary Manager**, then **Enter** to open the Add Dictionary Definition box and add a new word to the Dictionary.

- This dialog box has two fields: **Actual Word** and **Replacement Word**. Place your cursor at the beginning of the word you want to change and JAWS will place the word into the *Actual Word* field.
- Then press **Tab** to move to the **Replacement Word** field and enter the correct pronunciation. For example, if the PDF contains the acronym "EPA," JAWS will, by default, read that as "eee-pah." To correct the pronunciation, enter "EPA" in the **Actual Word** field and either "E P A" or "Environmental Protection Agency" in the **Replacement Word** field.
- Press **ALT+A** to hear the actual word and press **ALT+R** to hear the replacement word.
- When you are satisfied with the way JAWS says the replacement, press **Enter** to accept the change.
- **Changing the Dictionary** through the **Dictionary Manager Utility** within JAWS changes the **Default Dictionary** that controls all applications on the user's system (i.e., a modification in the **Dictionary Manager Utility** makes a global change on the user's system). Changing the EPA acronym is an example of a useful global modification. Adding true pronunciation for state abbreviations is another example of a useful modification to the Default Dictionary.
- JAWS also allows a user to modify a Dictionary for a specific application. To launch the **Dictionary Manager** from Acrobat 5.0 (on a computer that has JAWS installed), press **Insert+D**. The first time this is used, JAWS will automatically create an Application Dictionary File for that program using the name of the program and the extension .JDF. For those using JAWS as a means to test accessibility, this feature is useful because it can launch the Application Dictionary from within Acrobat to add unusual or unique abbreviations and acronyms as they are encountered in the document.
- Users need to be informed that the dictionary has been modified for acronyms and special abbreviations. This can be done by inserting a new tag with alternate text into the structure tree at the beginning of the PDF document stating that the dictionary was customized.

C. A note about JAWS and Adobe Type Manager ATM on Windows 98

Adobe Type Manager (ATM) is a utility used to view and print Post Script type One fonts on Windows 98 and Windows 95 systems. (It is included with the installation of PageMaker.) When using Adobe Acrobat on Windows 98 to create a PDF file, be aware that a conflict between ATM and JAWS exists – they both use the same system.ini file. ATM and JAWS cannot be used at the same time. To fix the problem, a user must manually change the system.ini file to specify which program needs to be used at the time.

For example, when using JAWS, change the line of code in the System.ini file that reads:

system.drv=atmsys.drv

to read

system.drv= system.drv

Return to using Adobe Acrobat and the Adobe Type Manager by changing the same line back to read:

system.drv=atmsys.drv.

D. Other Accessibility Tools

A user may want to consider using another screen reader, such as WindowEyes, or upgrading to Windows 2000. The Windows 2000 operating system handles PostScript font files so you can uninstall ATM. (This is recommended if you are using JAWS as your screen reader application.)

VIII. Creating PDFs from scanned materials

A. Steps to convert paper copies of documents to PDF

1. Scan document using any scanning software. Depending on the software, the output file may be a PDF if the software is new, otherwise a TIFF image is created.
2. If a TIFF image is created, in *Adobe Capture* software use "**Image with Text**" or "**Normal**" settings to create an OCR (Object Character Recognition) TIFF, thus creating a text layer to the document.
3. Then use the *Adobe Capture* software to convert the file to PDF, which now includes the OCR'd layer. A 300 dpi setting for text provides good resolution, however, if the scanned material involves a heavy use of graphics, an optimal resolution will have to be determined. PDF Document Index fields should be used to describe the graphics.
4. More translation errors appear for large documents using serif fonts (e.g., Times New Roman, Courier) compared to those that use sans-serif fonts (e.g., Arial, Helvetica).
5. See Section 5 regarding the next steps after the file is scanned and converted to PDF

IX. EPA linking standards for PDF files

- On every page which includes a PDF, a you should reference and link to [EPA's PDF page](http://epa.gov/epahome/pdf.html) (<http://epa.gov/epahome/pdf.html>), which explains what PDFs are and contains a link to Adobe Acrobat where readers may download the free Acrobat Reader. See some suggested language below:

You will need Adobe Acrobat Reader, available as a free download, to view some of the files on this page. See [EPA's PDF page](http://epa.gov/epahome/pdf.html) to learn more about PDF, and for a link to the free Acrobat Reader.

You will need Adobe Acrobat Reader, available as a free download, to view the files in this list. See [EPA's PDF page](http://epa.gov/epahome/pdf.html) to learn more about PDF, and for a link to the free Acrobat Reader.

- Placement of this disclaimer (or similar language in any format) may be at the top of a page that includes many PDFs, at the beginning of a paragraph or list of PDFs, or immediately before reference to the first PDF. In situations where the long version is problematic, you may use an inline [About PDF](#) link (e.g., (PDF, 23 pp., 46 KB, [About PDF](#)))
- Links should include file description, page number, file size:

(for example, **[Oregon Building Permits \(PDF, 5 pp., 68 KB\)](#)**,
[Wetland Funding Opportunities \(PDF, 20 pp., 465 KB\)](#))
- Provide as much description for the reader as possible. If the PDF is a poster, for example, you might provide the original dimensions:

(for example, **[How Far From the Nearest Road? \(PDF, poster 36 x 96 inches, 1 page, 3 MB\)](#)**)
- File naming conventions:

- File names should use all lower-case
- Do not use spaces or special characters in file names. Use underscores or hyphens instead of spaces
- Try to make the file name meaningful. It is often returned as part of search results and a meaningful file name can be beneficial.

X. Tips and Tricks About PDFs

A. Reducing File Size

1. **Optimizing PDFs for the Internet** The following steps will reduce the file size and prepare the PDF for page-at-a-time downloading (also known as “byte serving” or “fast web view” in Acrobat). Page-at-a-time downloading enables PDF files to appear quickly, even over slower modem connections.
 - a. To optimize PDF files in Acrobat 5.0, choose **Edit > Preferences > General**. Select **Options** in the left panel of the Preferences dialog box. Select **Save As Optimizes for Fast Web View**, and then click **OK**.
 - b. To complete the optimization process, choose **File > Save As** to save the file before posting. Even though the file name is the same, and the file is replacing the already saved document, using the **File > Save As** option does the following: consolidates duplicate images, consolidates duplicate page backgrounds, optimizes the document for fast web view, and removes unused objects in the document.
2. **Disable “Thumbnails”** Acrobat creates thumbnail views of each page, which can greatly increase the size of a PDF. Disabling this function can reduce your file size.
 - a. To remove Thumbnails in a document, display the Thumbnails by clicking the Thumbnails tab in the navigation pane or choose **Window> Thumbnails**. Click the Thumbnails drop-down menu and select **Remove Embedded Thumbnails**.
3. **Distiller “Job Options” Settings** Use care when establishing “Job Options” settings in Distiller. A number of the settings can impact file size.
 - a. Under the Compression tab are settings for Downsampling dpi, Compression, and Image Quality. The Images Downsampling dpi (higher dpi means larger file size). Compression (unchecked would result in larger file size). Quality options of Minimum, Low, Medium, High or Maximum. Better quality means larger file size.
 - b. Converting color graphics to gray scale can dramatically reduce file size.
 - c. CYMK files are generally larger than RGB files. The decision on which to use depends on your audience. RGB for screen displays and CYMK typically for printers.

B. Breaking larger files down (“chunking”)

1. You may wish to consider breaking larger source documents down into chapters, sections, etc. and creating separate PDFs for each.
2. You may wish to offer your document in both sizes: one large document as well as one broken up into segments. GAO recently reformatted its reports so that each report has a 1- to 2-page Highlights section (i.e. executive summary). GAO reports are now posted in both full and "Highlights" versions. If you're posting massive documents you might want to consider creating posting some sort of summary or overview of the document.

C. Problems with making PDFs accessible

1. Section 508 Requirements - Making Information Accessible

Remember that Section 508 requires that **information** we present on the web be made accessible (not just that PDFs be made accessible). There are going to be situations in which making a PDF accessible is simply not possible, due to time or resource constraints, or because even after you've tried Adobe's Make Accessible routine, and corrected any errors that were found, assistive technology (like JAWs) is still not able to read your document clearly (see some common problems listed below).

- a. You have many options available to providing information in an accessible format:
 - (1) create an HTML page
 - (a) To convert .pdf files into HTML format for use on your Web pages - BCL Magellan is a plug-in for Acrobat 4.0 or higher which allows you to perform this conversion automatically. When converting to HTML, this tool maintains the integrity of your document by preserving the text layout, along with the graphics, lines, hyperlinks, and bookmarks. You can choose cascading style sheets or layer HTML. The HTML output closely matches the original .pdf document. For more information, please visit their website at <http://www.bclcomputers.com>
 - (2) create a plain text document
 - (a) BCL Drake is a plug-in for Acrobat 4.x or higher that allow you to converts .pdf files to .rtf (rich text file) files. This tool allows you to convert your files to editable .rtf file while preserving the original document's layout and structure so that the information is presented. The conversion is reliable, with minor font substitutions that only slightly alter the finished product along with the artwork (EPA logo), text blocks, and other special graphics such as data chart.
 - (3) provide a telephone number and name so that a reader with disabilities can ask for assistance in accessing the information presented in the PDF file.

2. Common Problems Experienced in Making PDFs Accessible Using the Make Accessible Routine

- a. Any **change made to the PDF** (bookmark added/edited, etc.) requires you to repeat the steps to make the PDF accessible and to optimize the space (Document Properties will remain), so it is best to take these steps as the final actions in the PDF conversion process
- b. You may encounter **extraneous tags** that have been generated in the PDF document. For example, a graphic may be composed of 20-30 figure tags instead of just one tag you would expect to see. Extraneous tags basically clutter the PDF document structure, provide no useful purpose, bog down assistive technology devices (screen readers), and should be deleted when possible. The easiest approach to removing them is to locate the first and

last figure tag in the series, then delete all but one of this tags. Provide alternate text to the last remaining figure tag, and go on to the next graphic.

- c. Sometimes **graphical information** will be tagged as something other than a figure tag during the conversion process. Again this is a consistency issue. However, we have experienced a problem where graphical information has been completely lost in the conversion of a Microsoft source document after it was converted first in a WordPerfect document and then into PDF. If you have a Word document, you might want to have the document originator convert it into a PDF document, or convert by visiting a PC equipped with MS-Word.

D. Linking to a Specific Section Within a PDF

1. You can target a link inside a PDF document just like you can within an HTML document. You can also set various things like the view that comes up, the zoom factor, etc.
 - a. To send someone to a specific page (like page 3), the code is: ``
 - b. More detail is available on page 476 in the Acrobat Guide, accessible under the "Help" menu in Adobe Acrobat.

E. Other Helpful Links

1. Review file summary problems in the PDFs on Web pages in your TSSMS account. Useful link to include in any discussion of summary information guidelines for PDFs. <http://www.epa.gov/webmast1/metareports/pdf/>
2. Adobe's "How to Create Accessible PDF Files" http://www.adobe.com/products/acrobat/access_booklet.html
3. <http://www.pdfzone.com>
4. Adobe 6 enhancements - <http://www.adobe.com/products/acrobat/solutionsacc.html>
5. Distributing the Acrobat Reader on a CD along with EPA PDF files: <http://www.adobe.com/products/acrobat/acrrdistribute.html>

This page provides a form and the full license agreement.

XI. Consulted (and Quoted) Sources

Web Workgroup PDF Subcommittee members: Carolyn Offutt, Greg Spraul, Karen Reshkin, Sara Roman, Glenna Shields, Lorien Wendt, Carol Cotton, Jeffrey Levy, Judy Dew, Sally Martiny, Susan Dillman, John Leitzke, Kay Morrison, Christine Tran, Robert Johnson at TetraTech

EPA WebOwners ListServ

U.S. EPA Webguide - "Portable Document Format"
<http://www.epa.gov/webguide/create/pdftip.html>

U.S. EPA OECA - "PDF Conversion Checklist"
(<http://intranet.epa.gov/oeca/web/pdf/checklist-pdfconversion.pdf>) and "Product Review Checklist for PDF Files" (<http://intranet.epa.gov/oeca/web/pdf/checklist-pdf.pdf>)

U.S. EPA OERR Web Guide - "Portable Document Format (PDF) Information"
<http://www.epa.gov/oerrpage/info/pdfinfo.htm>

U.S. EPA Region 5's "Making Accessible PDFs for Use on EPA Web Site"

U.S. EPA OPP IRSD Web Team's "OPP Guidelines for the Conversion and Accessibility of PDF Documents"